

1. 基本情報

区分	森林	担当者名	山田俊郎
タイトル (英文)	Radiocesium transfer from hillslopes to the Pacific Ocean after the Fukushima Nuclear Power Plant accident: A review		
タイトル (和文)	福島原子力発電所事故後の山地斜面から太平洋への放射性セシウムの移行：レビュー論文		
キーワード	Fukushima, Cesium, Soil, Sediment, Forest, Modelling		
著者	Olivier Evrard, J. Patrick Lacey, Hugo Lepage, Yuichi Onda, Olivier Cerdan, Sophie Ayrault		
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(1) 対象地域

福島県全体

(2) 重要な図表

Table 3
Summary of research examining radiocesium in particulate/dissolved and K_d .

Author(s)	Catchment(s)	Sampling period	Radionuclide(s)	Particulate fraction of transported ^{137}Cs (%)	Average K (d)
Nagao et al. (2013)	Same/Natsui	July 2011–Dec. 2011	^{134}Cs & ^{137}Cs	99 flood conditions 33 base flow	2.5×10^6
Nagao et al. (2014)	Niida	May 2011–Nov. 2012	^{134}Cs & ^{137}Cs	47 (before Sept. 2011) 84 (after Sept. 2011)	N/A
Sakaguchi et al. (2015) Shinomiya et al. (2014)	Abukuma Experimental Catchment (Abukuma)	June 2011–Dec. 2012 June 2012	^{137}Cs ^{134}Cs & ^{137}Cs	80 92–97 flood conditions 12–96 base flow	8.8×10^5 N/A
Tsuji et al. (2014) Ueda et al. (2013)	Abukuma, Ota Niida	Sept. 2012–May 2013 July 2011–Nov. 2011	^{134}Cs & ^{137}Cs ^{134}Cs & ^{137}Cs	64 >90 flood conditions 40 base flow	N/A 3.5×10^5
Yamashiki et al. (2014) Yoshikawa et al. (2014)	Abukuma Abukuma	June 2011–May 2012 April 2012–Sept. 2012	^{134}Cs & ^{137}Cs ^{137}Cs	82–93 60–83 flood conditions 69–95 base flow	N/A 1.2×10^9 base 10.6×10^5 event
Yoshimura et al. (2015b)	Abukuma, Mano, Same, Fujiwara, Niida, Ota, Odaka, Asami, Ukedo,	Dec. 2012	^{134}Cs & ^{137}Cs	58–100 ^a	3.6×10^3

^a Excluding an estuary site.

Table 4
Summary modelling and monitoring results.

Author(s)	Type	Catchment(s)	Area (km ²)	Period	Radionuclides (particulate (P)-dissolved (D))	Export (TBq)	Catchment inventory exported (%)
Iwasaki et al. (2015)	Modelling	Abukuma (downstream reach)	31	September 2011	^{137}Cs (P)	3.29	n/a
Kinouchi et al. (2015)	Modelling	Abukuma (Kuchibuto subcatchment)	140	June 2011–December 2012	^{137}Cs (P)	0.274	0.8
Kitamura et al. (2014)	Modelling	Abukuma, Ukedo, Niida, Maeda, Kuma, Ota, Mano, Kido, Odaka, Tomioka, Natsui, Same, Ide, Uda	8352	Annually for the initial years after the accident	^{137}Cs (P)	8.4	1.0
Kurikami et al. (2014)	Modelling	Ukedo (Okagi Dam)	n/a	September 2013	^{137}Cs (D&P)	0.86 ^a	n/a
Mori et al. (2014)	Modelling	Un-named reservoir	15	March 2011–December 2013	^{137}Cs (P)	n/a	<5.0
Mouri et al. (2014)	Modelling	Tone (Kusaki Dam)	254	2010–2090	^{137}Cs (P)	900 Bq/kg ^b	n/a
Nagao et al. (2013)	Monitoring	Natsui, Same	749/600	March 2011–December 2011	^{134}Cs , ^{137}Cs (D&P)	0.04	n/a
Pratama et al. (2015)	Modelling	Abukuma	5172	August 2011–May 2012 + future scenarios	^{134}Cs , ^{137}Cs (D&P)	~12	2
Shinomiya et al. (2014)	Monitoring	Experimental Catchment (Abukuma)	0.01	June 2012	^{134}Cs , ^{137}Cs	115 (Bq m ²)	0.07
Ueda et al. (2013)	Monitoring	Niida (Wasriki and Hiso Rivers)	<5	July–November 2011	^{134}Cs , ^{137}Cs (D&P)	0.03	0.4
Yamada et al. (2015)	Modelling	Ukedo (Okagi Dam)	n/a	September 2013 & average flood	^{137}Cs (D&P)	0.07 & 0.35	n/a
Yamaguchi et al. (2014)	Modelling	Abukuma, Ukedo, Niida, Maeda, Kuma, Ota, Mano, Kido, Odaka, Tomioka, Natsui, Same, Ide, Uda	8352	March 2011–March 2012 + future scenarios	^{137}Cs (P)	0.23–6.5 ^c	0.5–7.5 ^c
Yamashiki et al. (2014)	Monitoring	Abukuma	5172	June 2011–May 2012	^{134}Cs , ^{137}Cs (P)	10.08	1.1

^a Deposited in the Okagi Dam.

^b Current annual deposition in the Kusaki Dam modelled to be ~900 Bq/kg.

^c Minimum and maximum values modelled over 30 y.

2. 提言につながる情報

(1) モニタリングへの活用

(2) 流出挙動・経路

(3) 除染の際の留意点

(4) 担当者のコメント

福島における最新の調査研究を網羅的にレビューした論文である。

福島事故での放射性セシウムの上流域から下流沿岸域までの移行について、基本的な考え方・視点が整理され、様々な流域からの流出について比較している。